DESIGN ENHANCEMENT AND IMPROVED POST-ACTUATION TEST METHODS FOR A 1/4" NORMALLY CLOSED PYRO VALVE

ABSTRACT

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The NASA/JPL Cassini mission to Saturn will launch in October, 1997. The Cassini Propulsion Module (C-PMS) will use numerous ordnance-actuated, normally-closed pyro valves to perform mission critical tasks over the 11 year design mission duration. The proper operation of this valve requires it to isolate fluid flow until commanded open. Once, open, the valve must allow an unobstructed fluid flow path and seal internally to prevent leakage external 10 the valve. This paper documents a design evolution to a Viking heritage, qualified design with improvements in design details that control external leakage to low levels that support the extremely long planetary design life of Cassini. In addition, it addresses an improved post-actuation leakage testing technique, used to detect gas leakage past the designed primary internal seal. A special Lot Acceptance Test (1 AT)/Qualification test program was structured to demonstrate performance of the newly designed valve: configuration.